



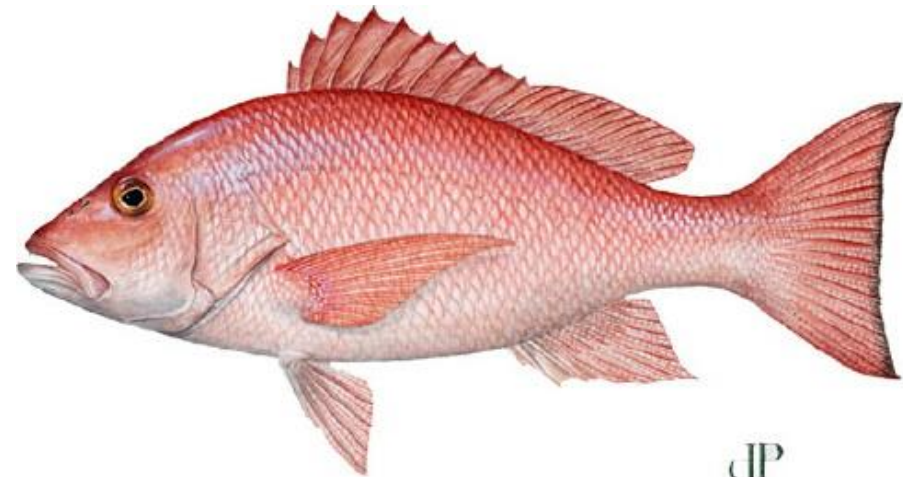
NOAA
FISHERIES

Southeast Fisheries
Science Center,
Beaufort Lab

Overview of SEFSC assessments – South Atlantic Red Snapper

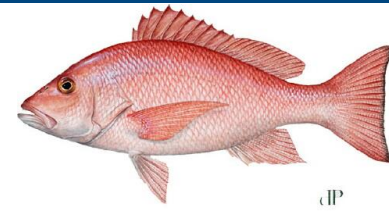
Erik Williams

**Chief, Sustainable Fisheries Branch
Beaufort Lab**



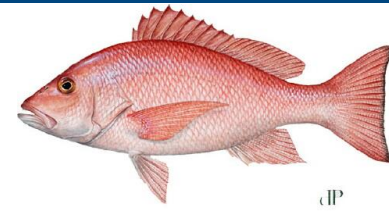
JP

Outline



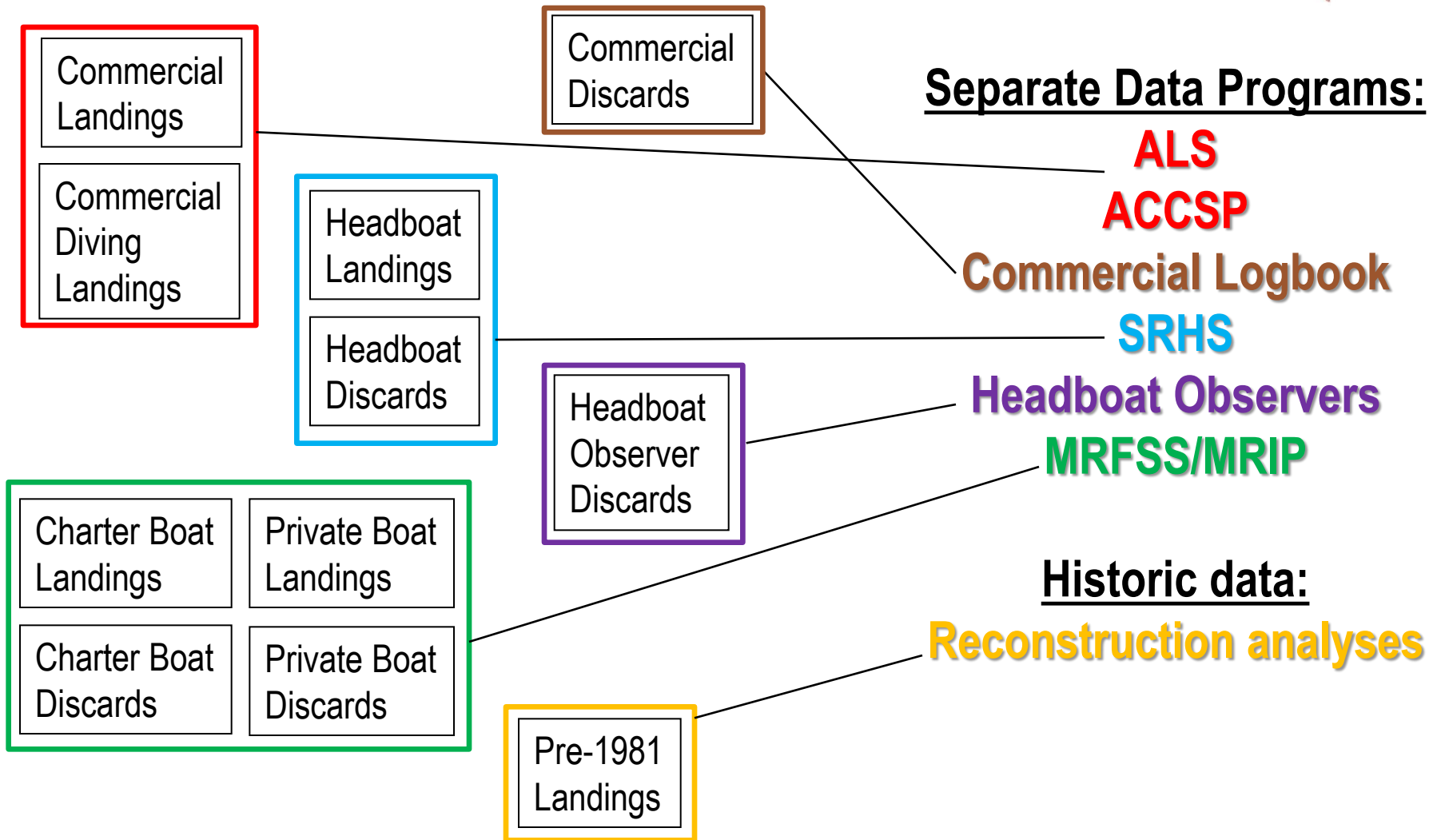
- Assessment history
- Data preparation
- Steps in process
- Modeling description
- Documentation
- Follow-up analyses and presentations
- Management actions

Assessment history



- 1990's estimated spawning potential ratios indicated fishery F rates ranged from $F_{9\%}$ to $F_{24\%}$, suggesting overfishing.
- SEDAR 15 benchmark stock assessment indicated overfishing and overfished state in 2008.
- SAFMC proposes fishery closure in 2010.
- SEDAR 24 benchmark stock assessment conducted in 2010.
- SEDAR 41 benchmark stock assessment underway in 2014.

Data preparation - Removals



Species ID not too much of an issue for red snapper

Data preparation - Compositions



Age Composition Data:

For-Hire	n=10 to 394 trips sampled annually
Private Boat	n=1 to 11 trips annually, many zero
Handline	n=10 to 294 trips/yr, missing years
Diving	n=17 to 124 for only three years

Length Composition Data:

For-Hire	n=10 to 394 trips sampled annually
Private Boat	n=1 to 11 trips annually, many zero
Handline	n=10 to 294 trips/yr, missing years
Diving	n=17 to 124 for only three years

Data Programs:

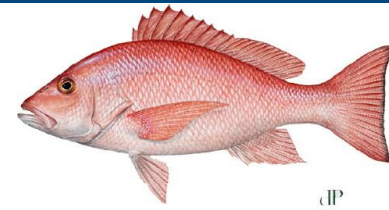
TIP

SRHS

MRFSS/MRIP

- Low sample sizes
- Some fleets insufficient for estimating selectivity
- Irregular sampling through the years

Data preparation - Indices



No Fishery Independent Data

Commercial
Handline
Logbook Index

Recreational
Headboat
Logbook Index

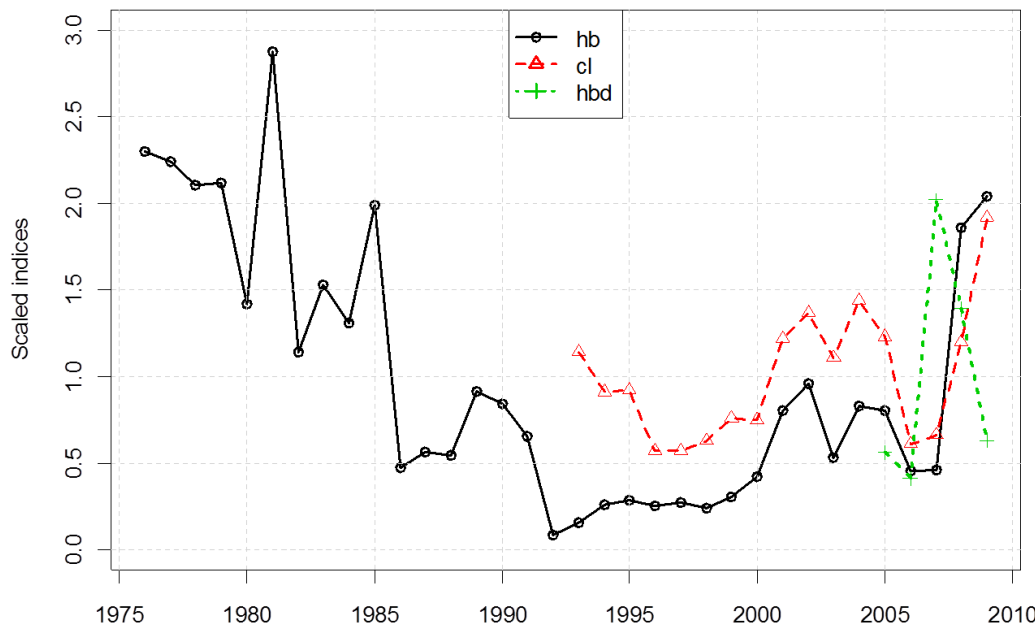
Headboat
Observer
Discard Index

Fishery Dependent Programs:

Commercial Logbook

SRHS

Headboat Observers



Catch rates were standardized

1. Stephens and MacCall method (multiple logistic regression) for trip selection
2. Delta-GLM to account for effects such as location, season, crew size, etc.

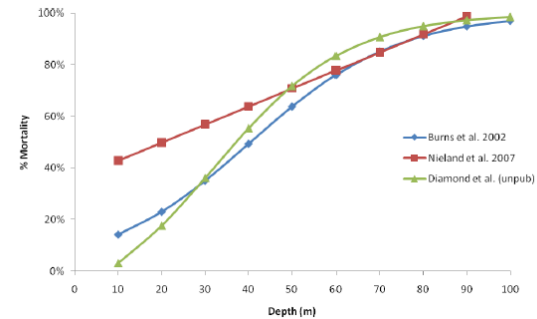
Data preparation – Life History



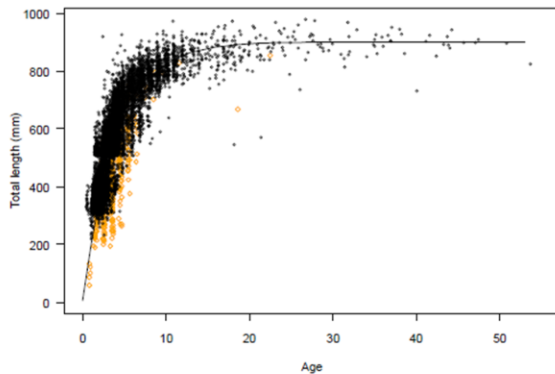
Life history studies
and age processing:
SCDNR – MARMAP
Beaufort Lab
FWC/FWRI

Discard
Mortality

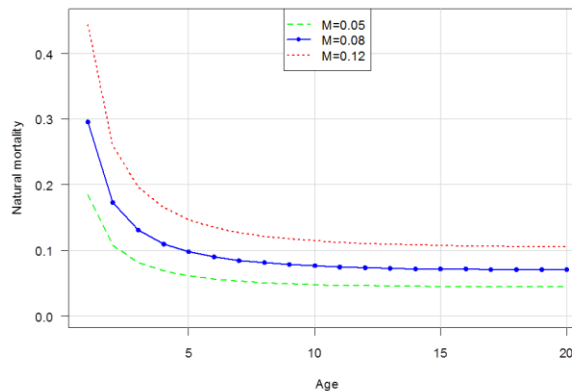
- Commercial lines: 0.48 (0.35, 0.62)
- For-hire: 0.41 (0.29, 0.54)
- Private: 0.39 (0.27, 0.52)



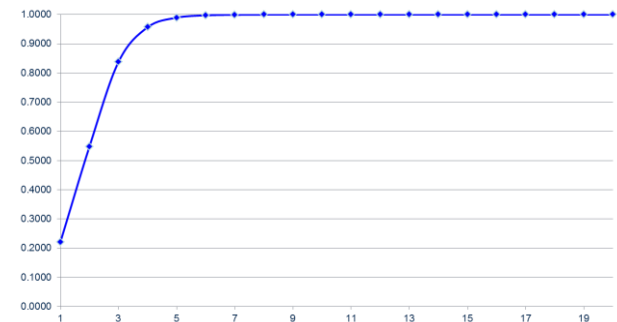
Age-Growth



Natural
Mortality



Maturity



- Maximum observed age of 54
- Hoenig estimate is $M=0.08$ (0.05, 0.12)

Steps in process



- Data submission deadline —————→ March 15, 2010
- Data workshop held in Charleston, SC —————→ May 24-28, 2010
 - 69 attendees, including 1 CIE reviewer
 - 73 working or reference documents
- Assessment webinars from —————→ June 18 to September 21, 2010
 - 66 attendees
 - 15 working and reference documents
- Review workshop in Savannah, GA —————→ October 12-14, 2010
 - 22 attendees, including 5 panelists (3 CIE, 2 SSC)
 - 3 working documents
- SSC review in Charleston, SC —————→ December 7, 2010

Brief modeling description



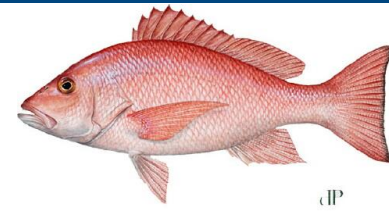
- **Models:**

1. Beaufort Assessment Model (BAM), a flexible statistical catch-age formulation implemented with the AD Model Builder software. Estimated parameters are systematically varied until characteristics of the simulated population match data on the real population.
2. A Surplus-Production Model Including Covariates (ASPIC).

- **Inputs:** Landings, discards (all self-reported), fishery-dependent relative indices of abundance, age composition data, growth function. NO fishery independent abundance data, LOW age sample sizes, particularly in early years, NO verified discard estimates.

- **Uncertainty:** Monte Carlo-Bootstrap procedure, recommended for use in SEDAR assessments (SEDAR Procedural Guidance 2010).

Documentation

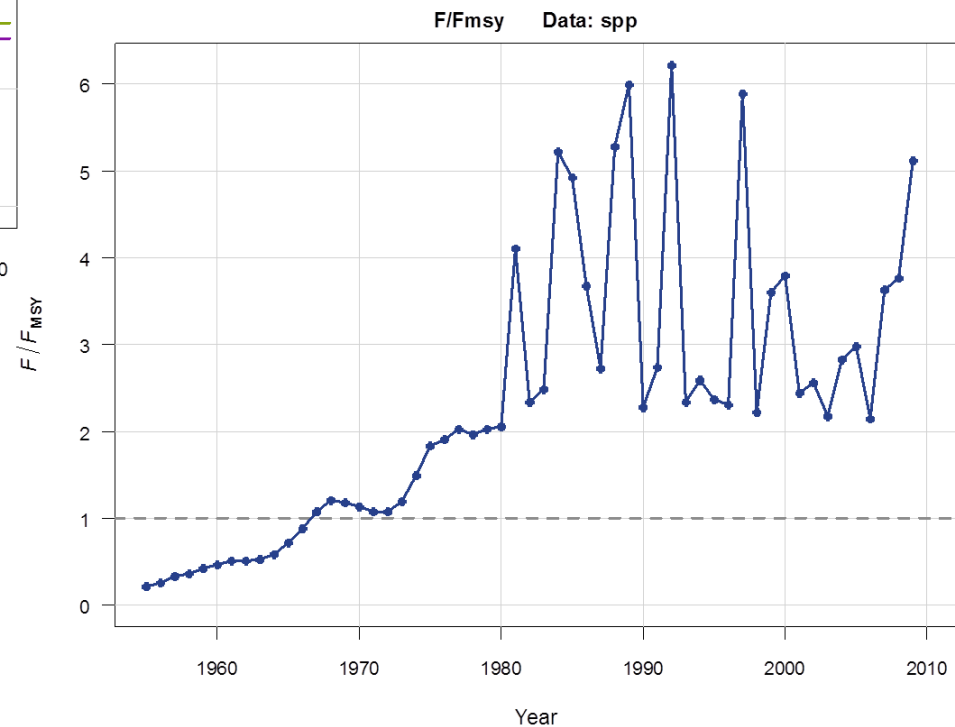
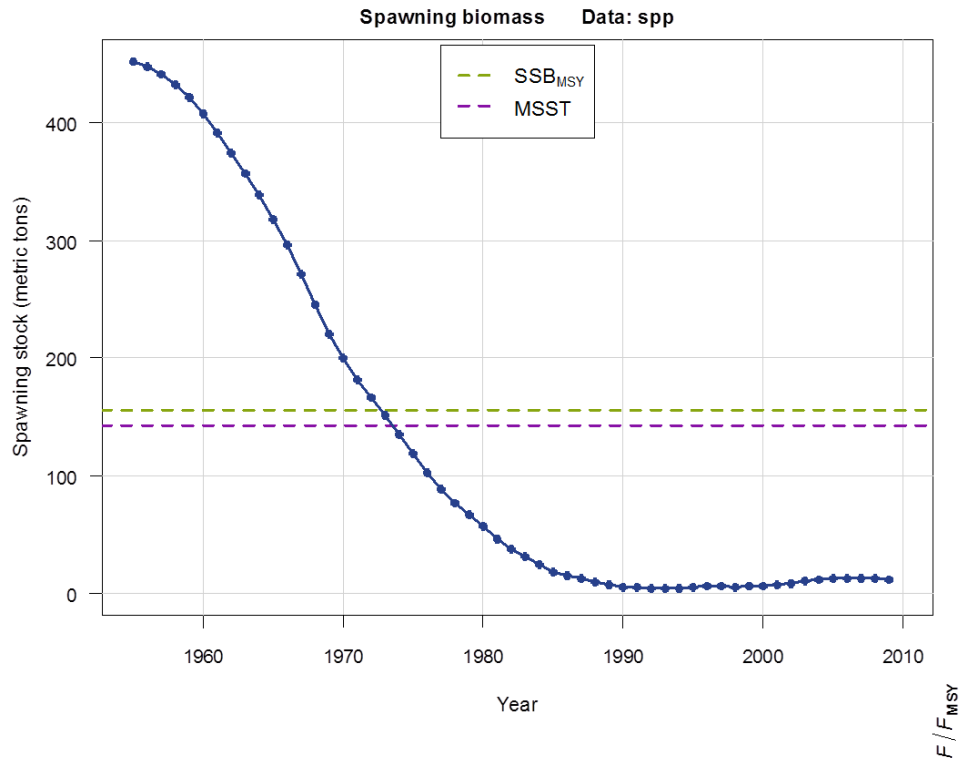


- Main SEDAR document (524 pages)
 - Section I - Introduction
 - Section II - Data Workshop Report
 - Section III - Assessment Workshop Report
 - Section IV - Research Recommendations
 - Section V - Review Workshop Report
 - Section VI - Addenda
- 91 working papers and reference documents
- Individual CIE reports issued separately
- All docs posted on SEDAR website, organized by SEDAR number

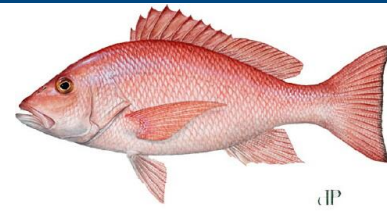
Results



(IP)



Follow-up analyses and presentations



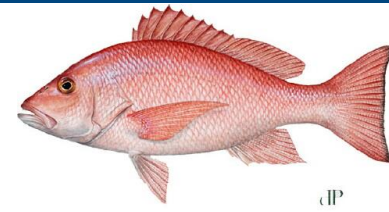
- At the SSC review, the base model selected for management was changed. Report re-written.
- Multiple sets of projections analyses to SERO.
- Multiple responses to questions about the assessment, including questions from fishermen, SAFMC, SSC, SERO, NMFS HQ, and Congress for more than a year after the review.

Management actions



- SAFMC voted to set the F_{MSY} proxy for red snapper at $F_{30\%}$, despite recommendations by SEDAR, the CIE reviewers, and their own SSC to use $F_{40\%}$
- Closure in 2010 and 2011, discard mortality only.
- Short openings in 2012 and 2013 (ABC = 86,000 dead fish).

Summary - Strengths



Data:

- Thorough examination of all data sources for red snapper

Process:

- Excellent documentation of the whole process, easily accessible
- Thorough discussions of model structure and results
- Participants learned much about stock assessments and red snapper

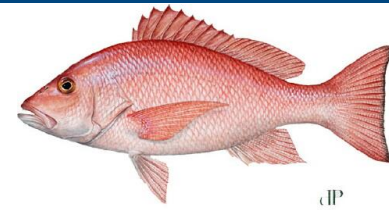
Results:

- Many discussions about results, healthy skepticism

Management:

- Many scenarios and projections explored for managers

Summary - Weaknesses



Data:

- Fishery dependent abundance indices suffer from changing catchability and potential hyperstability.
- Low age/length sample sizes = poor selectivity and recruitment estimates.
- For other species, species ID is an issue for landings

Process:

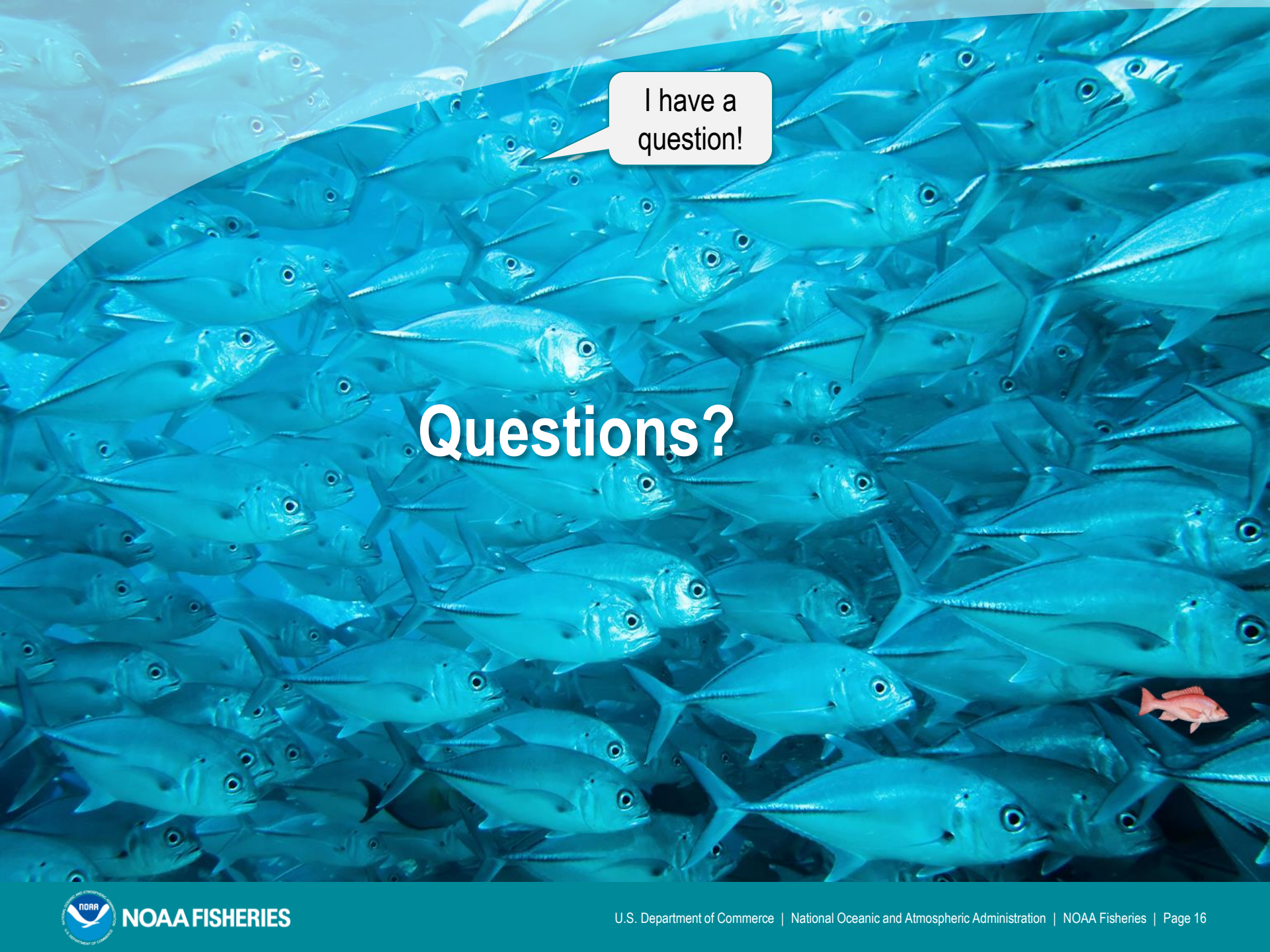
- Use of many resources, both time and money

Results:

- Lots of follow-up work (e.g. projection analyses, answers to questions, etc.)
- Management decisions shift to higher overfishing risks

Management:

- Recent regulations have affected the ability to use FD data for abundance indices

A large school of blue fish, possibly mackerels, fills the frame. They are all facing in various directions, creating a sense of movement. In the lower right corner, a single red fish stands out from the rest of the school.

I have a question!

Questions?



NOAA FISHERIES